Digitized by the Internet Archive
in 2026

https://archive.org/details/journal-of-chemical-thermodynamics_1991_23_contents

THE JOURNAL OF CHEMICAL THERMODYNAMICS

Volume 23, 1991

EDITORS

M. L. McGlashan
Department of Chemistry
University College London
20 Gordon Street
London WC1H 0AJ
U.K.

P. A. G. O'Hare
National Institute of
Standards and Technology
Building 222, Gaithersburg
MD 20899
U.S.A.

Assistant Editor: **M. B. Ewing** (University College London, U.K.)

ADVISORY BOARD

Chairman: G. Somsen (The Netherlands)

E. H. P. Cordfunke (The Netherlands)
G. Della Gatta (Italy)
J. H. Dymond (U.K.)
J. Fuger (Commission of the European Communities)
L. V. Gurvich (U.S.S.R.)
K. N. Marsh (U.S.A.)
G. M. Olofsson (Sweden)
D. Patterson (Canada)
G. Pilcher (U.K.)
G. M. Schneider (F.R.G.)
M. Sorai (Japan)
W. V. Steele (U.S.A.)
W. Wagner (F.R.G.)
R. D. Weir (Canada)
R. H. Wood (U.S.A.)
W. A. Wóycicki (Poland)

ACADEMIC PRESS
(Harcourt Brace Jovanovich, Publishers)
London San Diego New York
Boston Sydney Tokyo Toronto

Copyright © 1991 Academic Press Limited

ALL RIGHTS RESERVED

No part of this volume may be reproduced in any form, by photostat, microfilm, or any other means, without written permission from the publishers.

Printed in Great Britain

CONTENTS OF VOLUME 23

Number 1, *January* 1991

Lebedev, B. V.; Kulagina, T. G. Thermodynamics of the complex $(C_2H_5)_2Zn \cdot Te(C_2H_5)_2$ in the temperature range from 0 to 300 K 1

Zaitsev, A. I.; Korolyov, N. V.; Mogutnov, B. M. Thermodynamic properties of $\{xCa+(1-x)P\}$ 11

Czarnota, I. Heat capacity of benzene at high pressures 25

Acree, W. E., Jr.; Tucker, S. A.; Zvaigzne, A. I.; Yang Meng-Yan; Pilcher, G.; Ribeiro da Silva, M. D. M. C. Enthalpies of combustion of 2,4,6-trimethylbenzonitrile, 2,4,6-trimethylbenzonitrile *N*-oxide, 2,6-dimethylbenzonitrile, 2,4,6-trimethoxybenzonitrile, and 2,4,6-trimethoxybenzonitrile *N*-oxide: the dissociation enthalpies of the (N–O) bonds 31

Moriyoshi, T.; Uosaki, Y.; Takahashi, K.; Yamakawa, T. (Liquid + liquid) equilibria of (water + ethanol + cyclohexane) at the temperatures 298.15 K and 323.15 K . 37

Sharma, S. C.; Kumar, P.; Syngal, M. Excess enthalpies of (di-*n*-butyl ether + cyclohexane or benzene or toluene or ethyl benzene or *m*-xylene or *p*-xylene or mesitylene) at the temperature 303.15 K 43

Malhotra, R.; Woolf, L. A. Volume ratios $\{V(p)/V(0.1\ \text{MPa})\}$ for *n*-heptane at temperatures from 278 K to 338 K for pressures up to 400 MPa 49

Zielkiewicz, J.; Konitz, A. (Vapour + liquid) equilibria of (*N*,*N*-dimethylformamide + water + propan-1-ol) at the temperature 313.15 K 59

Quadri, S. K.; Khilar, K. C.; Kudchadker, A. P.; Patni, M. J. Measurement of the critical temperatures and critical pressures of some thermally stable or mildly unstable alkanols 67

Stølen, S.; Grønvold, F.; Westrum, E. F., Jr.; Kolonin, G. R. Heat capacity and thermodynamic properties of synthetic heazlewoodite, Ni_3S_2, and of the high-temperature phase $Ni_{3\pm x}S_2$ 77

Olofsson, G.; Wadsö, I.; Eberson, L. Design and testing of a calorimeter for measurements on electrochemical reactions with gas evolution 95

Tian, Y.; Michelberger, Th.; Franck, E. U. High-pressure phase equilibria and critical curves of (water + *n*-butane) and (water + *n*-hexane) at temperatures to 700 K and pressures to 300 MPa 105

Advice to authors 113

Number 2, *February* 1991

Chao, J. P.; Dai, M. Studies of thermodynamic properties of binary mixtures containing an alcohol. XVI. Excess molar enthalpies of each of (one of the four butanols + methyl ethyl ketone or methyl isobutyl ketone) at the temperature 298.15 K . 117

Hedwig, G. R. The partial molar volumes and partial molar isentropic pressure coefficients of the amino acid L-asparagine in aqueous solution at the temperature 298.15 K 123

Quadri, S. K.; Kudchadker, A. P. Measurement of the critical temperatures and critical pressures of some thermally stable or mildly unstable esters, ketones, and ethers . 129

Pawlak, Z.; Kuna, S.; Richert, M.; Giersz, E.; Wisniewska, M.; Liwo, A.; Chmurzynski, L. Acidity constants of 19 protonated *N*-bases in cyclohexanone, acetone, and butan-2-one 135

Sharonov, K. G.; Mishentseva, Y. B.; Rozhnov, A. M.; Miroshnichenko, E. A.; Korchatova, L. I. Molar enthalpies of formation and vaporization of *t*-butoxybutanes and thermodynamics of their synthesis from a butanol and 2-methylpropene. I. Equilibria of synthesis reactions of *t*-butoxybutanes in the liquid phase . . 141

Jung, W.-G.; Kleppa, O. J. Enthalpies of formation of Me_3U (Me = Ru, Rh, Pd) by high-temperature reaction calorimetry 147

Moriyoshi, T.; Tsubota, T.; Hamaguchi, K. Compressions and densities of (water + a C_1 to C_4 *n*-alkylamine) at the temperature 298.15 K. 155

Chao, J. P.; Wang, Y. X.; Dai, M. Studies of thermodynamic properties of binary mixtures containing an alcohol. XVII. Excess molar enthalpies of each of (one of the four butanols + *N*,*N*-dimethylacetamide or *N*,*N*-dimethylformamide or dimethyl sulfoxide) at the temperature 298.15 K 163

Feng, H.; Wang, Y.; Shi, J.; Benson, G. C.; Lu, B. C.-Y. Excess enthalpies of (methyl formate or nitroethane + an *n*-alkane) and of (nitromethane + butan-1-ol or hexan-1-ol or ethan-1,2-diol) 169

Pieperbeck, N.; Kleinrahm, R.; Wagner, W.; Jaeschke, M. Results of (pressure, density, temperature) measurements on methane and on nitrogen in the temperature range from 273.15 K to 323.15 K at pressures up to 12 MPa using a new apparatus for accurate gas-density measurements 175

Iyer, V. S.; Venugopal, V.; Sood, D. D. Standard molar Gibbs free energies of formation of $Na_2Mo_2O_7$(s), $Na_2Mo_3O_{10}$(l), and $Na_2Mo_3O_6$(s) by solid-oxide-electrolyte galvanic cells 195

Dallos, A.; Ratkovics, F. Densities of pentan-2,4-dione at temperatures from 287.15 K to 313.15 K 207

BOOK REVIEW (**Authors,** Title, **Reviewer**)
Cordfunke, E. H. P.; Konings, R. J. M.: editors. Thermochemical Data for Reactor Materials and Fission Products. **M. G. Adamson.** 211

Number 3, *March* 1991

Majer, V.; Hui, L.; Crovetto, R.; Wood, R. H. Volumetric properties of aqueous 1–1 electrolyte solutions near and above the critical temperature of water. I. Densities and apparent molar volumes of NaCl(aq) from 0.0025 mol·kg^{-1} to 3.1 mol·kg^{-1}, 604.4 K to 725.5 K, and 18.5 MPa to 38.0 MPa 213

García Baonza, V.; Cáceres Alonso, M.; Arsuaga Ferreras, J.; Núñez Delgado, J. Measurements of (p, ρ, T, x) for $\{xCS_2 + (1-x)CH_2Cl_2\}$(l) at the temperature 298.15 K and pressures up to 100 MPa 231

Guedes, H. J. R.; Zollweg, J. A.; Streett, W. B. Enthalpy of mixing of liquid (carbon dioxide + ethane) at the temperature 230.8 K and of liquid (carbon dioxide + *n*-butane) at 221.4 K and 241.4 K 239

Pruzan, Ph. Thermophysical properties of liquid *n*-hexane at temperatures from 243 K to 473 K and at pressures to 500 MPa 247

Grønvold, F.; Stølen, S.; Labban, A. K.; Westrum, E. F., Jr. Thermodynamics of iron sulfides. I. Heat capacity and thermodynamic properties of Fe_9S_{10} at temperatures from 5 K to 740 K 261

Miltenburg, J. C. van; Verdonk, M. L. Molar heat capacities of 2-chloronaphthalene at temperatures between 5 K and 370 K 273

Schramm, B.; Weber, Ch. Measurements of the second virial coefficients of some new chlorofluorocarbons and of their mixtures at temperatures in the range from 230 K to 300 K 281

Nagata, I. Isothermal (vapour + liquid) equilibria of (methanol + butan-1-ol + acetonitrile + benzene) 293

Cordfunke, E. H. P.; Konings, R. J. M.; Meyssen, S. R. M. Vapour pressures of some caesium compounds. I. $CsBO_2$ 297

Number 4, *April* 1991

Schneider, G. M. High-pressure investigations on fluid systems—a challenge to experiment, theory, and application. (The eighth Rossini Lecture of the Commission on Thermodynamics of IUPAC delivered on 31 August 1990 at its Conference on Chemical Thermodynamics held in Como, Italy) 301

Ortega, J. $H_m^E\{xCH_3(CH_2)_{\nu-1}CO_2CH_3$ ($\nu = 5$ or 6 or ⋯ or 14) + $(1-x)CH_3(CH_2)_{11}CH_3$, 298.15 K} 327

Majer, V.; Crovetto, R.; Wood, R. H. A new version of vibrating-tube flow densitometer for measurements at temperatures up to 730 K 333

Lentz, H.; Weber, M. Phase diagrams of molar volume against mole fractions at given temperatures and pressures for (methane + ethane + ammonia) 345

Tamura, K.; Nagata, I. Excess molar enthalpies of (propan-1-ol + butan-2-one) and of (propan-1-ol or propan-2-ol + butan-2-one + benzene) at the temperature 298.15 K 359

Majer, V.; Hui, L.; Crovetto, R.; Wood, R. H. Volumetric properties of aqueous 1–1 electrolyte solutions near and above the critical temperature of water. II. Densities and apparent molar volumes of LiCl(aq) and NaBr(aq) at molalities from 0.0025 $mol \cdot kg^{-1}$ to 3.0 $mol \cdot kg^{-1}$, temperatures from 604.4 K to 725.5 K, and pressures from 18.5 MPa to 38.0 MPa 365

Piacente, V.; Pompili, T.; Scardala, P.; Ferro, D. Temperature dependence of the vaporization enthalpies of *n*-alkanes from vapour-pressure measurements . . 379

Number 5, *May* 1991

Weir, R. D. A profile of Edgar F. Westrum, Jr. and his contributions to science . . 397

Boerio-Goates, J. Heat-capacity measurements and thermodynamic functions of crystalline α-D-glucose at temperatures from 10 K to 340 K 403

Callanan, J. E.; Weir, R. D. The thermodynamics of the divalent-metal fluorides. IV. Heat capacity of $MSnF_4$, M = Pb, Ba, or Sr, at temperatures from 300 K to 660 K. 411

Grolier, J.-P. E.; Roux-Desgranges, G.; Berkane, M.; Wilhelm, E. Heat capacities and densities of mixtures of very polar substances. 1. Mixtures containing acetonitrile. 421

Chirico, R. D.; Knipmeyer, S. E.; Nguyen, A.; Steele, W. V. The thermodynamic properties of dibenzothiophene 431

Cordfunke, E. H. P.; Konings, R. J. M.; Ouweltjes, W. The standard enthalpy of formation of In_2O_3 451

White, M. A.; Neshvad, G. The heat capacities of the tantalates MTa_2O_6, M = Mg, Fe, Co, Ni 455

Inaba, A.; Shirakami, T.; Chihara, H. Heat capacities of physisorbed films on solids. I. Nitrogen and carbon monoxide on graphite. 461

Johnson, G. K.; Tasker, I. R.; Jurgens, R.; O'Hare, P. A. G. Thermodynamic studies of zeolites: clinoptilolite 475

Kuratomi, N.; Yamamuro, O.; Matsuo, T.; Suga, H. Heat capacity and glass transition of acetone clathrate hydrate. 485

Cheda, J. A. R.; Fernández-García, M.; Ferloni, P.; Fernández-Martín, F. {Thallium(I) *n*-tetradecanoate + *n*-tetradecanoic acid} phase diagram: formation of a molecular complex 495

Berezovsky, G. A.; Paukov, I. E.; Sukhovey, K. S.; Chusova, T. P. Thermodynamic properties of indium triiodide in the temperature range 5 K to 360 K . . . 503

Goudiakas, J.; Jemine, X.; Fuger, J. Thermodynamics of lanthanide and actinide perovskite-type and related oxides. V. Molar enthalpies of formation of M_2NpO_4 (M = Li, Na, K, or Cs) and of β-Na_4NpO_5 513

Number 6, *June* 1991

Obituary: Rossini, F. D. 521

Kuskova, N. V.; Kukarin, V. F.; Martynets, V. G.; Matizen, E. V. Study of the phase equilibrium of $\{(1-x)CO_2+xKr\}$ for $x < 0.032$ near the critical point of CO_2 . 523

Kling, G.; Maurer, G. The solubility of hydrogen in water and in 2-aminoethanol at temperatures between 323 K and 423 K and pressures up to 16 MPa . . . 531

Baranova, T. A.; Pirkes, S. B.; Bugayevskii, A. A.; Kholin, Yu. V.; Kostromina, N. A. Complexing thermodynamics of 3-amino-5-sulfosalicylic acid with rare-earth elements 543

Róg, G.; Kozłowska-Róg, A.; Zakuła, K.; Pycior, W. Determination of the activities in the solid solutions $\{xMnO+(1-x)CaO\}$ by a solid-electrolyte galvanic cell in the temperature range 900 K to 1100 K 547

Sipowska, J. T.; Ott, J. B.; Neely, B. J.; Izatt, R. M. Excess enthalpies for (propane + methanol) at the temperatures (298.15, 323.15, 348.15, and 373.15) K and pressures (5, 10, and 15) MPa, and at 363.15 K and (5 and 15) MPa 551

Faizullin, M. Z.; Skripov, V. P. Investigation of the (T, p, x) surface of phase separation of $\{xH_2O+(1-x)NC(CH_3)CHCHCHC(CH_3)\}$ in the vicinity of the line of lower critical points of dissolution 561

Doubéret, G.; Pal, A.; Høiland, H.; Anowi, O.; Davis, M. I. Thermodynamic properties of (ethan-1,2-diol + water) at the temperature 298.15 K. I. Molar volumes, isobaric molar heat capacities, ultrasonic speeds, and isentropic functions. . . . 569

Krishnamurthy, D.; Bhat, N. P.; Mathews, C. K. Reaction of WO_2 with liquid sodium and standard Gibbs energies of formation of the resulting ternary oxides . . 581

Kemp, W. J. M. van der; Jacobs, L. C.; Oonk, H. A. J.; Schuijff, A. The vapour composition and pressure over solid potassium chloride: new mass-spectrometric results and effusion masses. 593

Zielkiewicz, J. (Vapour + liquid) equilibria in (propan-1-ol + *n*-hexane + *n*-heptane) at the temperature 313.15 K 605

Marshall, W. L.; Simonson, J. M. The (liquid + vapor) critical-temperature curve for $\{xD_2O + (1-x)H_2O\}$ 613

Number 7, July 1991

Abdulagatov, I. M.; Stepanov, G. V.; Bouy, O. A. Equation of state and thermodynamic properties of propan-1-ol 617

Rozhnov, A. M.; Safronov, V. V.; Verevkin, S. P.; Sharonov, K. G.; Alenin, V. I. Enthalpy of combustion and enthalpy of vaporization of 2-ethyl-2-methoxypropane and thermodynamics of its gas-phase synthesis from (methanol + a 2-methylbutene) . 629

Sharonov, K. G.; Mishentseva, Y. B.; Rozhnov, A. M.; Miroshnichenko, E. A.; Korchatova, L. I. Molar enthalpies of formation and vaporization of *t*-butoxybutanes and thermodynamics of their synthesis from a butanol and 2-methylpropene. 2. Enthalpies of combustion and vaporization of *t*-butoxybutanes . . 637

Letcher, T. M.; Prasad, A. K. The excess enthalpy and excess volume of (1,3,5-trimethylbenzene + an alk-1-yne) at the temperature 298.15 K 643

Colgate, S. O.; Sivaraman, A.; Dejsupa, C.; McGill, K. Acoustic resonance determination of sonic speed and dew points in a natural-gas mixture and retrograde condensate. 647

Weir, R. D.; Westrum, E. F., Jr. Thermodynamic properties of ammonium haloplatinates. II. Heat capacity and thermodynamic functions of deuterated ammonium hexachloroplatinate $(ND_4)_2PtCl_6$ at temperatures from 5 K to 350 K . . 653

Kapała, J.; Skudlarski, K. The thermodynamics of $\{xNaCl + (1-x)AgCl\}$ measured by mass spectrometry 667

Kabata, Y.; Yamaguchi, S.; Takiguchi, Y.; Uematsu, M. Measurements of the vapor pressure of 2,2,2-trifluoroethanol in the temperature range from 320 K to 400 K . 671

Amigo, A.; Bravo, R.; Paz Andrade, M. I. Excess molar enthalpies of (*n*-decan-1-ol + an *n*-alkane) at the temperatures 298.15 K and 308.15 K 679

Ott, J. B.; Sipowska, J. T.; Izatt, R. M. Excess enthalpies for (propane + acetonitrile) at the temperatures (298.15, 313.15, 323.15, 333.15, 338.15, and 348.15) K and at the pressures (5, 10, and 15) MPa. Determination of (liquid + liquid) equilibria from the calorimetric results 687

Wang, B.-H.; Adcock, J. L.; Mathur, S. B.; Van Hook, W. A. Vapor pressures, liquid molar volumes, vapor non-idealities, and critical properties of some fluorinated ethers: $CF_3OCF_2OCF_3$, $CF_3OCF_2CF_2H$, *c*-$CF_2CF_2CF_2O$, CF_3OCF_2H, and CF_3OCH_3; and of CCl_3F and CF_2ClH 699

NOTE

Svoboda, V.; Zábranský, M.; Bárta, M. Molar heat capacities of 2-methoxyethanol, 2-ethoxyethanol, and 2-propoxyethanol in the temperature range from 298 K to 330 K 711

Number 8, *August* 1991

Goodwin, A. R. H.; Frørup, M. D.; Stenby, E. H. Microwave detection of dew points: results for complex mixtures. 713

Wieczorek, S. A. Thermodynamics of aqueous mixtures of polyoxyethene glycol monoethers. I. Excess molar volumes of (2-butoxyethanol + water) . . . 717

Biswas, S. N.; Seldam, C. A. ten The equation of state and heat capacity of nitrogen at high pressures determined from speeds of sound 725

Lee, H.; Hong, W.-H.; Won, S.-H.; Chung, H.-S. Vapor pressures of (ethanol + lithium chloride) and of (water + ethanol + lithium chloride) at low temperatures . . 739

Flanigan, D. A.; Kidnay, A. J.; Yesavage, V. F. Enthalpy of (*m*-cresol + quinoline) at temperatures between 291 K and 655 K and at pressures to 10342 kPa . . 745

Chirico, R. D.; Knipmeyer, S. E.; Nguyen, A.; Steele, W. V. The thermodynamic properties of benzo[*b*]thiophene 759

Boone, S.; Kleppa, O. J. Determination of the standard enthalpy of formation of $Ni_{2.55}P$ by high-temperature drop calorimetry 781

Zhou, L.; Wang, Y.; Zhang, Y.; Shi, J.; Benson, G. C.; Lu, B. C.-Y. Excess enthalpies of (an *n*-alkane + tetrachloromethane + benzene) at the temperature 298.15 K . 791

Pomianek, T.; Midura, J.; Wnuk, G. Influence of lanthanum on the activity of Pb in $\{(-x_1-x_2)Cu+x_1Pb+x_2La\}$(l) for $x_1, x_2 \ll 1$ at the temperature 1473 K . . 803

Number 9, *September* 1991

Bešter, M.; Dolar, D. Thermodynamic studies of phase equilibria in (water + 1,4-dioxane + sodium chloride) 809

Nissema, A.; Kokkonen, P. Excess molar enthalpies of (dimethyl sulfoxide + cyclohexanol), (dimethyl sulfoxide + toluene), (cyclohexanol + toluene), and (dimethyl sulfoxide + cyclohexanol + toluene), at the temperatures 303.15 K, 313.15 K, and 325.15 K 817

Pashinkin, A. S., Muratova, V. A., Moiseyev, N. V.; Bazhenov, J. V. Heat capacity and thermodynamic functions of iron diarsenide in the temperature range 5 K to 300 K. 827

Zaitsev, A. I.; Zemchenko, M. A.; Mogutnov, B. M. Thermodynamic properties of $\{(1-x)Si+xFe\}$(l). 831

Łencka, M.; Persson, O.; Rasmussen, P. A modified Dvořak–Boublík (vapour + liquid) recirculating still with continuous analysis of the compositions of phases . . 851

Ratkovics, F.; Palágyi-Fényes, B.; Hajós-Szikszay, É.; Dallos, A. (Liquid + liquid) equilibria of (ethanoic acid + an alkanol or a ketone or an ester or an aromatic hydrocarbon + water) at the temperature 293.15 K 859

Malhotra, R.; Woolf, L. A. Thermodynamic properties of propanone (acetone) at temperatures from 278 K to 323 K and pressures up to 400 MPa. 867

Pikkarainen, L. Excess enthalpies of (butan-1-ol or 2-methylpropan-2-ol + formamide or *N*-methylformamide or *N*,*N*-dimethylformamide) 877

Goodwin, A. R. H.; Bradsell, C. H.; Bryant, P. L.; Toczylkin, L. S. Measurement of the densities of complex fluids: apparatus, validation, and results for water and for each of three complex mixtures (retrograde condensates) 883

Bugajewski, Z.; Bylicki, A. (Solid + liquid) phase equilibria at atmospheric pressure for (*N*-methylpyrrolidin-2-one + 3,4-dimethylphenol) 901

Number 10, *October* 1991

Bravo, R.; Pintos, M.; Amigo, A. Excess molar volumes of (*o*-xylene + *n*-heptane + toluene or *n*-hex-1-ene) at the temperature 298.15 K 905

Fenclová, D.; Dohnal, V. (Vapour + liquid) equilibria and excess molar volumes of {1,1,2-trichlorotrifluoroethane (freon 113) + an oxygenated solvent or *n*-hexane}. 911

Banipal, T. S.; Garg, S. K.; Ahluwalia, J. C. Heat capacities and densities of liquid *n*-octane, *n*-nonane, *n*-decane, and *n*-hexadecane at temperatures from 318.15 K to 373.15 K and at pressures up to 10 MPa 923

Zaitsev, A. I.; Zemchenko, M. A.; Mogutnov, B. M. Thermodynamic properties of iron silicides and phase equilibria in $\{(1-x)\mathrm{Si}+x\mathrm{Fe}\}$ 933

Cordray, D. R.; Gunderson, L. D.; Christensen, J. J.; Oscarson, J. L.; Izatt, R. M. The excess molar enthalpies of $[x\mathrm{CO_2}+(1-x)\{0.5\mathrm{CH_3(CH_2)_4CH_3} + 0.5\mathrm{CH_3(CH_2)_{10}CH_3}\}]$ at the temperatures (308.15, 323.15, 373.15, and 413.15) K and at the pressures 7.50 MPa and 12.50 MPa, and of $\{x\mathrm{CO_2}+(1-x)\mathrm{CH_3(CH_2)_7CH_3}\}$ at 373.15 K and 7.50 MPa and 12.50 MPa. . 941

Goodwin, A. R. H.; Bradsell, C. H.; Toczylkin, L. S. Measurement of the densities of complex fluids: results at temperatures between 288 K and 343 K and at pressures up to 30 MPa for each of two mixtures (crude oils) of specified composition . 951

Steele, W. V.; Chirico, R. D.; Knipmeyer, S. E.; Nguyen, A. The thermodynamic properties of 2-aminobiphenyl 957

Leu, A.-D.; Chung, S. Y.-K.; Robinson, D. B. The equilibrium phase properties of (carbon dioxide + methanol) 979

Onoda-Yamamuro, N.; Matsuo, T.; Suga, H. Thermal, electric, and dielectric properties of $\mathrm{CH_3NH_3SnBr_3}$ at low temperatures 987

Number 11, *November* 1991

Joyce, T. P.; Yesavage, V. F. Enthalpy of (*m*-cresol + quinoline + 1,2,3,4-tetrahydronaphthalene) at temperatures between 291 K and 670 K and at pressures to 10342 kPa 1001

Sipowska, J. T.; Ott, J. B.; Woolley, A. T.; Izatt, R. M. Excess enthalpies for (ethane + butan-1-ol) at (298.15, 323.15, and 348.15) K and at (5, 10, and 15) MPa . . 1013

Tanaka, R.; Adachi, M. Excess heat capacities of (chlorobenzene + an aromatic hydrocarbon) at the temperature 298.15 K 1023

Hedwig, G. R.; Høiland, H. Thermodynamic properties of peptide solutions. 8. Isentropic pressure coefficients $(\partial V_{2,\phi}/\partial p)_S$ of the apparent molar volume $V_{2,\phi}$ for each of the aqueous solutes: diglycine, triglycine, and tetraglycine 1029

Carter, R. W.; Wood, R. H. Calibration and sample-measurement techniques for flow heat-capacity calorimeters 1037

Ortega, J. Excess enthalpies of (a methyl alkanoate + *n*-nonane or *n*-undecane) at the temperature 298.15 K 1057

Baehr, H. D.; Tillner-Roth, R. Measurement and correlation of the vapour pressures of 1,1,1,2-tetrafluoroethane (R 134a) and of 1,1-difluoroethane (R 152a) 1063

Bastos, M.; Kimura, T.; Wadsö, I. Some thermodynamic properties of dialkylsulphides and dialkyldisulphides in aqueous solution 1069

Coxam, J.-Y.; Quint, J. R.; Grolier, J.-P. E. Modification of a C-80 Setaram calorimeter for measuring heat capacities of liquids at temperatures up to 548 K and pressures up to 20 MPa 1075

Książczak, A. Vapour pressures of binary three-phase (solid + liquid + vapour) mixtures. VI. {4-(*n*-Pentyl)phenylthiol-4′-(*n*-octyloxy)benzoate + *n*-hexane)} . . 1085

Książczak, A. Vapour pressures of binary three-phase (solid + liquid + vapour) mixtures. VII. Melting temperatures of the solid phases of *n*-dodecan-1-ol . . 1091

Number 12, *December* 1991

Lebedev, B. V.; Kulagina, T. G. Thermodynamic properties of borazole at temperatures from 0 to 310 K 1097

Ewing, M. B.; Goodwin, A. R. H. Thermophysical properties of alkanes from speeds of sound determined using a spherical resonator. 4. 2-Methylpropane at temperatures in the range 251 K to 320 K and pressures in the range 5 kPa to 114 kPa . . 1107

Cordfunke, E. H. P.; Konings, R. J. M. The vapour pressure of UCl_4 1121

Uosaki, Y.; Kitaura, S.; Iwama, F.; Moriyoshi, T. Compressions of some amides at pressures up to 200 MPa and at the temperature 298.15 K 1125

Artal, M.; Muñoz Embid, J.; Velasco, I.; Otín, S. Excess volumes of (1-chlorobutane or 1,2-dichloroethane or tetrachloromethane or 1,1,2,2-tetrachloroethane + dichloromethane or trichloromethane) and of (dichloromethane + trichloromethane) at the temperature 298.15 K 1131

Svoboda, V.; Finke, M. The entropy of isothermal vaporization and other functions of vaporization for (methanol + benzene), (methanol + cyclohexane), and (benzene + cyclohexane) 1135

Crovetto, R.; Wood, R. H.; Majer, V. Revised densities of $\{xCO_2+(1-x)H_2O\}$ with $x < 0.014$ at supercritical conditions. Molar volumes, partial molar volumes of CO_2 at infinite dilution, and excess molar volumes 1139

Boone, S.; Kleppa, O. J. Determination of the standard molar enthalpy of formation of Pd_3P by direct-synthesis drop calorimetry 1147

Rusby, R. L. The conversion of thermal reference values to the ITS-90 . . . 1153

Ewing, M. B.; Goodwin, A. R. H. Vapour pressures of 2-methylbutane determined using comparative ebulliometry 1163

Finch, A.; Gardner, P. J.; Head, A. J.; Majdi, H. S. The enthalpies of formation of 1,2,4-triazol-5-one and 3-nitro-1,2,4-triazol-5-one. 1169

Vine, M. D.; Wormald, C. J. The enthalpy of benzene 1175

NOTE

Hongo, M.; Kusunoki, M.; Arai, Y. (Vapor + liquid) equilibria of (butan-2-ol + butan-1-ol) at the temperature 298.15 K 1181

INDEX TO VOLUME 23 1183